

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

THIS PAGE BLANK (USPTO)

EP 0, 238, 983 A2

**Translated from French by the Ralph McElroy Translation Company
910 West Avenue, Austin, Texas 78701 USA**

EUROPEA
EUROPEAN PATENT

Int. Cl.⁴:

Filing No.:

Filing Date:

Priority:

Date:

Country:

No.:

Publication Date:

Designated Contracting States:

AUTOMATIC RI

Inventor:

Applicant:

Agent:

The invention consists of:

- a. a casing (1) with an opening (6) in
- b. one or more porous insert components being saturated with a volatile p
- c. an electric heating element (3) placed positioned in such a way that each heat el

- Key: 1 Control Logic
2 Oscillator (time-based)
3 Counter - records interval
4 Return to zero

The invention concerns an automatic device to dispense purifying vapor into the surrounding atmosphere and, more specifically, it concerns a device that permits the automatic and repeated activation of purifying vapor dispensing over a predetermined time period. The market for air deodorizers has grown significantly in the last decade, and a variety of techniques have been put forward to produce articles designed to mask or neutralize unpleasant odors in living areas, public spaces, or closed environments.

Among the proposed techniques, most are dependent on the use of perfume as their sole active ingredient, and their diffusion is achieved by such different items as "spray," aerosol, or mechanical means, or solid perfume instantiation of various kinds. Among the latter are devices containing as the active component a tablet or disk made of paper or other fibrous plant or polymer material that is saturated with an active purifying, perfuming, deodorizing, insecticide, insect repellent, or anti-bacterial substance.

The prior state of the art also includes articles comprising a variety of activation devices whose function is to accelerate diffusion of vapors of the purifying agent in the atmosphere. To that end, one suggestion has been to use a source of heat or forced ventilation.

US Patent No. 4,346,059, granted on August 24, 1982 to Donald Spector, described such an example, the source of heat consisting of an electric bulb placed inside a closed chamber containing in its upper part an absorbent porous pad saturated with a perfuming agent. In the described item, activation and diffusion of the resulting perfuming vapor are achieved by turning on the electric bulb, which causes heat to be released, and the difference in air pressure between the air so heated and the atmosphere above the saturated pad results in the forced circulation of heated air toward the pad. Other devices using an electric activation system have been proposed in the past. For example, US Patent No. 4,467,177 dealt with an item capable of being connected directly to the power system by means of an ordinary plug, which item is characterized by a double-heating system making it possible to achieve two temperature levels: one high temperature level suitable for evaporating insecticidal substances, and a more moderate temperature level to evaporate perfuming and deodorizing agents.

Known devices have a major disadvantage: they work by the continuous emission of purifying vapor. While such a principle is hardly a problem for the diffusion of vapor from insecticidal substances, in general, its application for the diffusion of perfuming agents quickly

means of a switch (11) of the type that once it is engaged, it causes heating of the air inside the chamber formed by the walls of the casing and convection movement of the air through the porous component located immediately above, and simultaneously draws air from the outside atmosphere through the opening (6) in the base of the casing; and

d. a sequencer component with an oscillator capable of controlling the composed sequence on a time basis, and a counter associated with a logic system connected to the switches of the heating elements such that activation of the heating elements occurs sequentially according to a process that alternately provides for a heating period followed by a cooling period for each heating element.

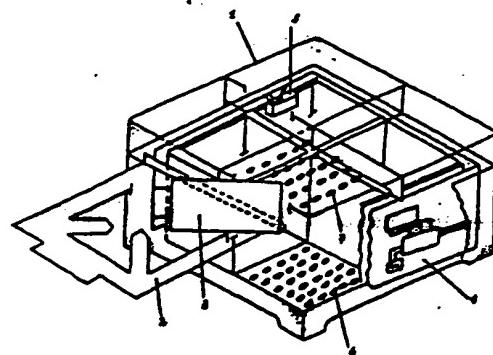


Figure 2

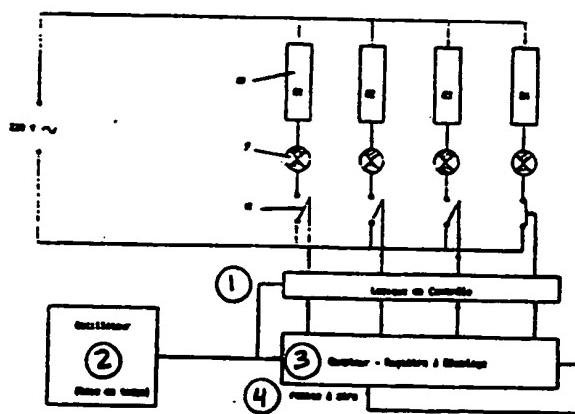
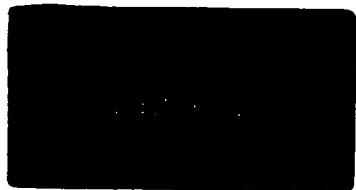
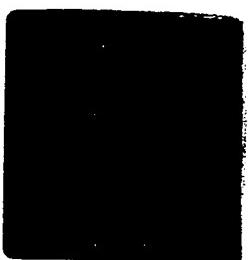


Figure 4



causes the phenomenon of habituation and olfactory saturation, which, for the observer, translates to a marked desensitization vis-a-vis the perfuming agents commonly employed.

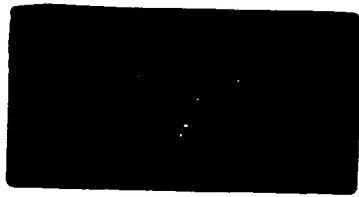
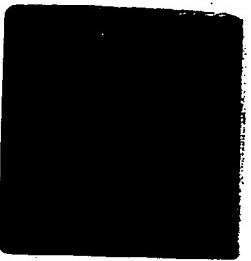
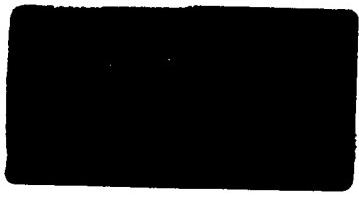
The invention is based on the observation that, by renewing the nature of the active perfuming agents in the atmosphere, this desensitization may be prevented.

In effect, the object of the invention is an automatic device to activate and repeatedly or alternately diffuse vapors of volatile purifying agents, said device being characterized in that it comprises:

- a. a casing with an opening in its base and apertures in its roof;
- b. one or more porous insert components located below said apertures, each of said components being saturated with a volatile purifying agent of a distinct nature;
- c. an electric heating element placed below each of said porous components, positioned in such a way that each heating element is activated sequentially and separately by means of a switch of the type that, once it is turned on, causes heating of the air inside the chamber formed by the walls of the casing and a convection motion of the air through the porous component located immediately above, and simultaneously draws air from the outside atmosphere through the opening in the base of the casing;
- d. a sequencer component with an oscillator capable of controlling the composed sequence on a time basis, and a counter associated with a logic system connected to the switches of the heating elements such that activation of the heating elements occurs sequentially according to a process that alternately provides for a heating period followed by a cooling period for each heating element.

Thus, the device according to the invention controls diffusion of vapor from volatile purifying agents over time. To the extent that each porous component can be separately saturated with a different purifying agent, it is possible, thanks to this device, to vary at will the nature of the perfume one wishes to release in a given area. The diffusion time, also to be determined at the discretion of the user, may be chosen as a function of the volume of the area or the nature of the perfume used, in particular as a function of its volatility. Finally, by alternating the activation/diffusion (heating) periods with rest (cooling) periods, the latter being characterized by a gradual reduction in diffusion, it will prevent the phenomenon of habituation by the user, who is thus able to keep his or her olfactory perception constantly aroused, and will fully perceive any new odor released during the next activation period. The device according to the invention thus presents clear advantages over known vaporization devices.

The start of the use cycle may occur either by the user turning it on directly, for example by means of a switch connecting the device to the main power system, or by automatic start-up by which insertion of a porous component saturated with a volatile active agent engages the device's electrical power and starts the sequential diffusion process.



during this phase and ceases completely after a few moments. A new impulse from the oscillator repeats the process, with another switch being turned off and resistance R3 being supplied with power for a time t_1 . This process is repeated for a complete cycle until each of the resistances has been activated once, and the unit is again ready for a new cycle.

In the device illustrated in the indicated figures, the porous component that serves as a holder for the volatile purifying substance consists of a component having four separate branches, on each of which is deposited a different purifying substance. When the operating cycle is complete, the result is the alternating diffusion of four different volatile substances. It is understood that, according to the invention, other devices may be made to diffuse a variable number of volatile substances; the number of heating elements will naturally be dependent on the number of substances.

The proper adjustment of the oscillator by means of a variable resistance makes it possible to establish at will the duration of the heating and cooling times. These periods may be identical or different. The specific choice of the ohmic value of the resistances ($R_1 - R_n$) will also permit adjustment at will of the heating temperature, the latter being selected in function of the volatility and thermal stability of the volatile purifying substance.

The diffusion of said substance is facilitated by the presence of an opening, either a single opening or a plurality of slits or apertures 6 (see Figure 2), made in the base of casing 1. The air in the chamber, heated during activation, diffuses through the porous component and entrains with it the vapor of the purifying substance that diffuses through apertures 7 located in the top of the casing, while at the same time drawing air from the outside atmosphere which enters the chamber through opening 6.

As for the purifying substance, in the device according to the invention, it is possible to use the usual perfuming, scenting, or deodorizing substances, as well as insecticidal, anti-bacterial, and animal repelling or attracting substances.

The volatile purifying substance may be chosen from among a multitude of perfuming compounds or scent ingredients commonly used in the perfume industry. To that end, the specific choice that may be made is such that it is superfluous to mention the possible different ingredients. It is worth mentioning, however, those described in the specialized literature, for example in S. Arctander, "Perfume and Flavor Chemicals," Montclair, N.J. (1969). Such substances are preferably used in the form of an aqueous solution.

It remains understood that the specific use of one or another of these substances is a function of the specific use and of the desired result. Thus, the user may determine the nature of the desired substance or substances and may make his or her selection from among a wide range of known substances according to his or her taste and the desired use.

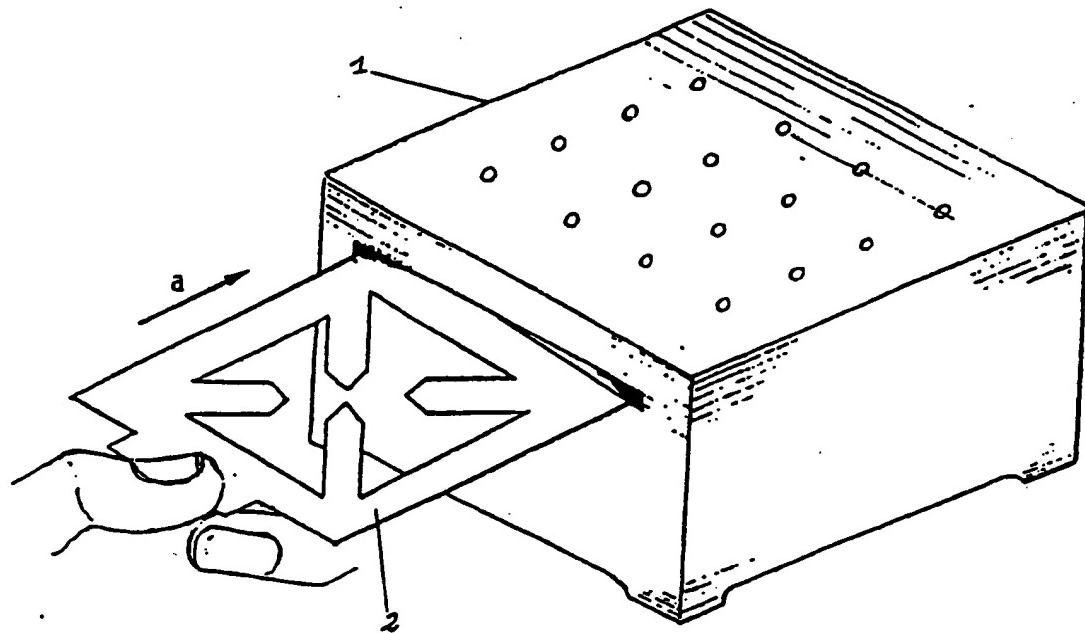
DRAWINGS

Figure 1

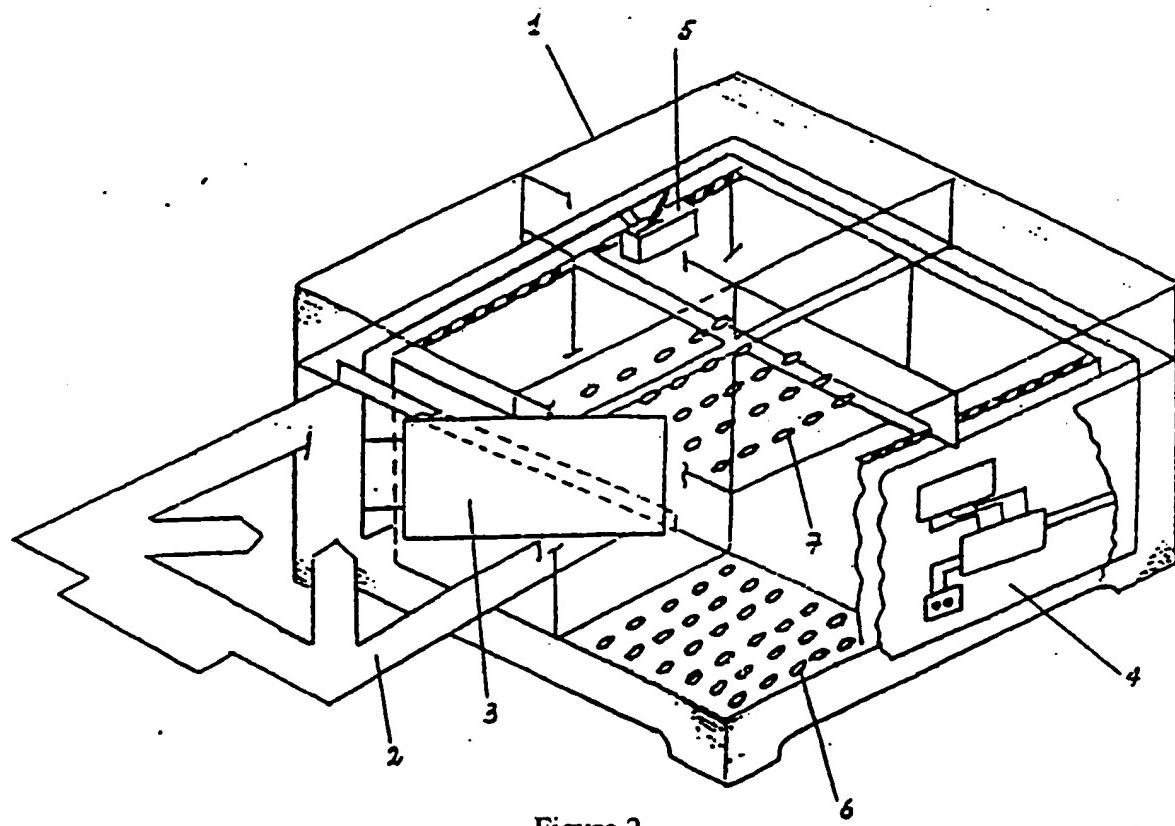


Figure 2

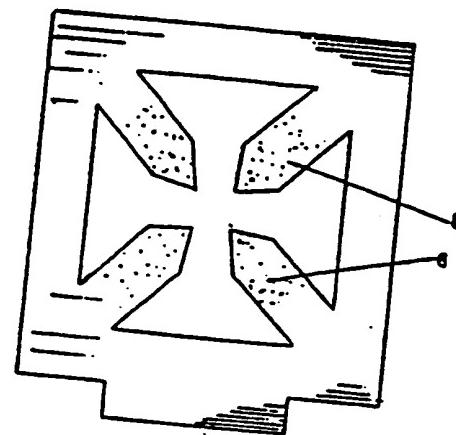


Figure 3

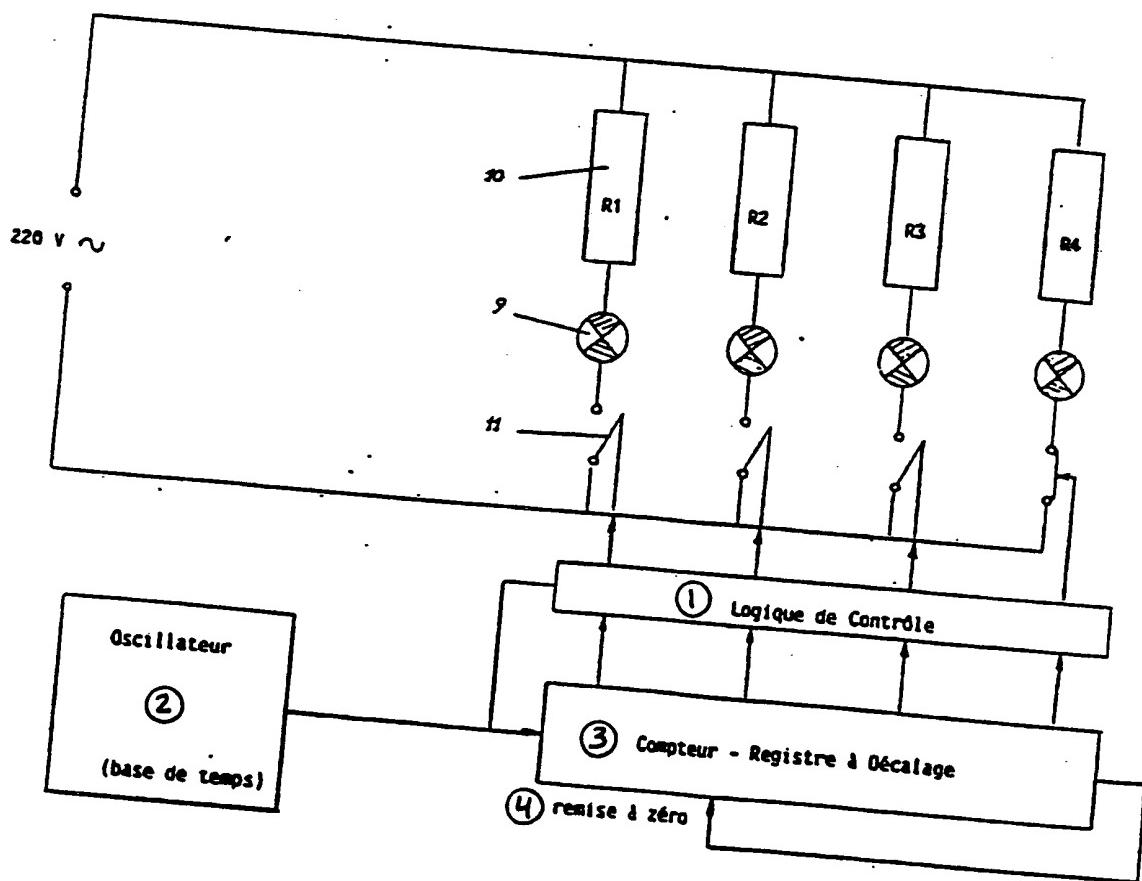


Figure 4

- Key:
- 1 Control Logic
 - 2 Oscillator (time-based)
 - 3 Counter - records interval
 - 4 Return to zero

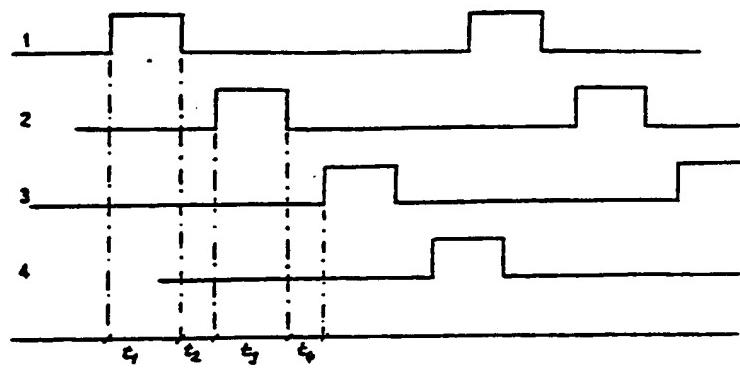


Figure 5

THIS PAGE BLANK (USPTO)